

XXVIII. *Monograph of the Genus Panorpa, with Descriptions of some Species belonging to other allied Genera.*
By J. O. WESTWOOD, F.L.S.

[Read 5th May, 1841.]

A VALUABLE Monograph on the family *Panorpidæ* having been recently published by Dr. F. Klug, in the "Transactions of the Berlin Academy for 1836," I have thought that it would be both useful and interesting to give descriptions of such new species of this family as I have met with in the principal collections of London, by way of supplement to the memoir of the learned professor of Berlin.

In the monograph above mentioned are described thirteen species of *Nemoptera*, (which genus is however correctly regarded as not naturally belonging to this family,) five of which, from Caffraria and Arabia, are new; eleven species of *Bittacus*, eight of which, natives of the Cape of Good Hope, Senegal, Mexico, Chili, Brazil and New Holland, are new; and seven species of *Panorpa*, two of which, from Mexico, are new. In the genus *Boreus* is contained only the *B. hyemalis*. And, lastly, a new genus is established under the name of *Chorista*, founded upon an Australian species (*C. Australis*, Klug), resembling the ordinary *Panorpa* in size, but not having the front of the head rostrated, although the parts of the mouth are analogous to those of *Panorpa*. The female only of this interesting insect has yet been recorded. Still more recently Dr. Burmeister has published the description of another new species of *Panorpa* from the East Indies, in his "Handbuch der Entomologie." Such is the extent of our present knowledge of this family. It is therefore with pleasure that I am able to add considerably not only to the species but even to the genera of this family. I regret, however, that I am unable to add any further account of the preparatory states of the species than is contained in my "Introduction to the Modern Classification of Insects." Since that work was published a very elaborate memoir on the internal anatomy of the common species has appeared in the "Annals of Natural History," published in Holland by Van der Hoeven.

Genus PANORPA, Linnæus.

A. Species Europææ.

Sp. 1. *Panorpa communis*, Linnæus.

Fusco-nigra, meso- et metathorace linea media lata lutea, abdominis apice rufo; alis ad apicem subacutis, hyalinis, venis fasciis maculisque nigris, stigmatate elongato; vena prima longitudinali, pone stigma, ter furcata.

Sp. 2. *Panorpa Germanica*, Linnæus.

Fusco-nigra, meso- et metathorace linea media lutea, abdominis apice rufo-luteo; alis ad apicem rotundatis hyalinis, venis fasciis maculisque nigris, stigmatate breviori; vena prima pone stigma bis furcata.

Such are the only characters which I have been able to discover which afford any satisfactory ground for the establishment of more than a single species amongst the British individuals belonging to this genus. By Mr. Stephens five species are given as British, namely:—1. *P. communis*, Linn.; 2. *P. affinis*, Leach; 3. *P. apicalis*, Steph.; 4. *P. borealis*, Steph.; and 5. *P. Germanica*, Steph.; but the characters given by him of these supposed species rest only on difference of size and variation of marking of the wings, neither of which appear to me to afford grounds for specific distinctions. The *P. Germanica* of Linnæus is described by that author as half the size of *P. communis*, with the wings only marked with a dark apical spot and stigma. The *P. Germanica* of Stephens wants the apical spot, but has a dark mark on the costal edge of the wings. Dr. Klug has, however, reduced all those supposed species to varieties of *P. communis*, a step which will, I believe, in the end, be found to be correct. In fact Mr. Stephens himself states (Illust. 6, p. 53) that *P. borealis* may be a variety of *P. Germanica*, and he has subsequently informed me that he is now of the same opinion as regards *P. apicalis*. After a very careful examination of specimens of the remaining three species—*P. communis*, *affinis*, and *Germanica*—I must confess that I can find no decided characters beyond those given above; I therefore consider *P. affinis* as a variety of *P. Germanica*, and I am not without an idea that the variation in the form of the wings, and the difference in the number of furcations of the veins behind the stigma, will also prove unsatisfactory and insufficient.

Sp. 3. *Panorpa rufostigma*, Westwood.

Fulva, thorace luteo, lateribus nigris; alis hyalinis, fusco maculatis apiceque fusco, stigmatate magno rufo; vena 1ma longitudinali, post stigma, bis furcata.

Long. corp. cum cauda extensa $5\frac{3}{4}$ lin., expans. alar. lin. 13.

Habitat in Albania. D. S. S. Saunders.

Antennæ nigræ, articulis duobus basalibus fulvis. Caput fulvum, regione ocellorum lineaque supra basin antennarum nigris. Meso- et metathorax obscurè lutei, lateribus nigricantibus; scutellis luteis. Abdomen obscure fulvum, segmentis duobus basalibus ad basin nigris; cauda forcipeque ejusdem magnitudine ut in *P. commune*, pallide fulvis. Corpus subtus obscure luteum, pedibus magis fulvescentibus; alis hyalinis, stigmatate magno rufo, punctis tribus ante medium, in triangulum dispositis, linea irregulari obliqua pone stigma apiceque fuscis. An var. *P. Germanicæ*?

B. Species Asiaticæ.

Sp. 4. *Panorpa appendiculata*, Westwood.

Nigra, capite thoraceque fulvis; abdominis segmento 2do in ♂ appendiculo tenui valde elongato, alis nigris, albo-variis.

Expans. alar. 1unc.

Habitat Madras. D. W. Elliott. Mus. Britann. ♂ ♀.

Caput cum rostro luteo-fulvum. Antennæ nigræ, articulis 2us basalibus fulvis. Thorax fulvus, metathorax magis fulvescens. Pedes lutei, tarsi obscurioribus. Abdomen nigrum; forceps ♂ niger, maris segmentum 2dum in appendiculo pallide flavescenti elongato tenui et supra segmenta tria sequentia extenso productum, segmentum 5um inerme. Alæ nigræ, fasciis 5 latis irregularibus albis, 4ta interrupta; vena 1ma longitudinali post stigma bis furcata.

Sp. 5. *Panorpa Javanica*, Westw.

Nigra, thoracis abdominisque lateribus rufescentibus; alis sublatis hyalinis, fasciâ parvâ, postice dilatâtâ, ante medium alæ, fasciâ alterâ latâ, postice furcatâ pone medium; apiceque lato nigris.

Expans. alar. lin. $13\frac{3}{4}$.

Habitat in Java. D. Horsfield. In Mus. Soc. Merc. Ind. Orient.

Nigra, thoracis et abdominis lateribus rufescentibus; apex abdominis ♀ piceus; rostrum rufum. Antennæ nigrae, basi rufæ. Pedes rufi, tarsis obscurioribus. Alæ sublatae, vena prima longitudinali post stigma ter vel quadri-furcata, hyalinæ puncto parvo versus basin; fascia parva, antice interrupta et postice dilatata ante medium alæ; puncto altero oblongo paullo post medium alæ et versus stigma, fascia latissima postice furcata, apiceque lato nigris.

Sp. 6. *Panorpa angustipennis*, Westw.

P. nigra, rostro rufo, lobis lateralibus thoracis luteis, alis valde elongatis, basi angustis, fasciâ tenuissimâ ante medium alterâque versus apicem postice furcatâ; apice lato, postice abbreviato, nigris ♀.

Expans. alar. lin. $19\frac{1}{4}$.

Habitat "Tennasserim Coast" India vel Java. In Mus. D. Hops.

Caput nigrum, rostrum rufum, valde elongatum. Antennæ longæ, nigrae; articulis duobus basalibus rufis. Thorax niger, lobis lateralibus meso- et metathoracis luteis. Abdomen nigrum, ventre, pectore pedibusque luteis; tarsis obscurioribus. Alæ elongatae, basi valde angustae, hyalinæ; fascia tenuissima abbreviata ante medium alæ, puncto medio, fascia ante apicem (ad costam dilatata postice angusta et furcata) apiceque (antice lato postice tamen abbreviato) nigris; vena 1ma longitudinali post stigma ter furcata.

Sp. 7. *Panorpa furcata*, Hardwicke. (Linn. Trans. xiv. t. 5, f. 2—6.)

Testacea, alis flavescentibus, punctis 4 ante medium, fasciâ latâ postice furcatâ apiceque lato nigris; abdominis ♂ segmento 5to furcâ cornea armato, 6mo et 7mo valde elongatis.

Long. corp. ♂ (cum forcip.) lin. $16\frac{1}{2}$, expans. alar. lin. 17— $19\frac{1}{2}$.

Habitat in Nepalia. D. Hardwicke. Mus. nostr. &c. ♂ ♀.

Sp. 8. *Panorpa Charpentieri*, Burmeister.

Capite abdomineque fuscis, thorace cum pedibus testaceo, dorso infuscato; alis hyalinis, puncto singulo fusco in cellula una media.

Long. corp. ♂ lin. $7\frac{1}{2}$, ♀ 6 lin.

Habitat in India Orientali.

P. *Charpentieri*, Burmeister, Hanb. d. Ent. 2, p. 958.

Sp. 9. *Panorpa Japonica*, Thunberg.

Nigra, pedibus testaceis, alis hyalinis, fasciis duabus maculisque atris.

Magn. *P. communis*.

Habitat in Japonia.

P. Japonica, Thunberg, Nov. Ins. Sp. Diss. 3, p. 67, f. 9; Klug, Mon. Panorp. p. 26; Olivier, Enc. Méth. 8, 715; Burm. Handb. d. Ent. 2, p. 957.

C. Species Americanæ.

Sp. 10. *Panorpa rufa*, G. R. Gray.

Rufo-testacea, antennis fuscis, basi rufescentibus, regione ocellorum nigra; alis elongatis, apice subacutis, hyalinis; maculis duabus basalibus, fascia obliqua ante medium, macula media costali, fascia pone medium postice furcata apiceque nigris, punctis nonnullis hyalinis in apice nigro; abdomine ♂ elongato, segmento 5to supra inermi.

Expans. alar. lin. $12\frac{1}{4}$.

Habitat in Georgia Americæ. In Mus. Britann. ♂ ♀.

Panorpa rufa, G. R. Gray, in Griffith's Animal Kingd. Insects, pl. 105, fig. 2.

Panorpa fasciata, Klug. Mon. Panorp. p. 25.

Sp. 11. *Panorpa lugubris*, Swederus.

Nigra, abdomine ferrugineo, apice nigro, segmento 5to ♂ inermi; alis nigris, albo-maculatis.

Expans. alar. lin. 12.

Habitat in America Septentrionali. Mus. nostr. ♂ ♀.

P. lugubris, Swederus. Swed. Trans. 1787, p. 279; Klug. Mon. Panorp. p. 20.

P. scorpio, Fabr. Ent. Syst. Emend. 2, p. 97; Oliv. Enc. Meth. 8, p. 715; Leach, Zool. Miscell. 2, tab. 94, f. 3, 4; Burmeister, Handb. d. Ent. 2, p. 957.

Sp. 12. *Panorpa nebulosa*, Westw.

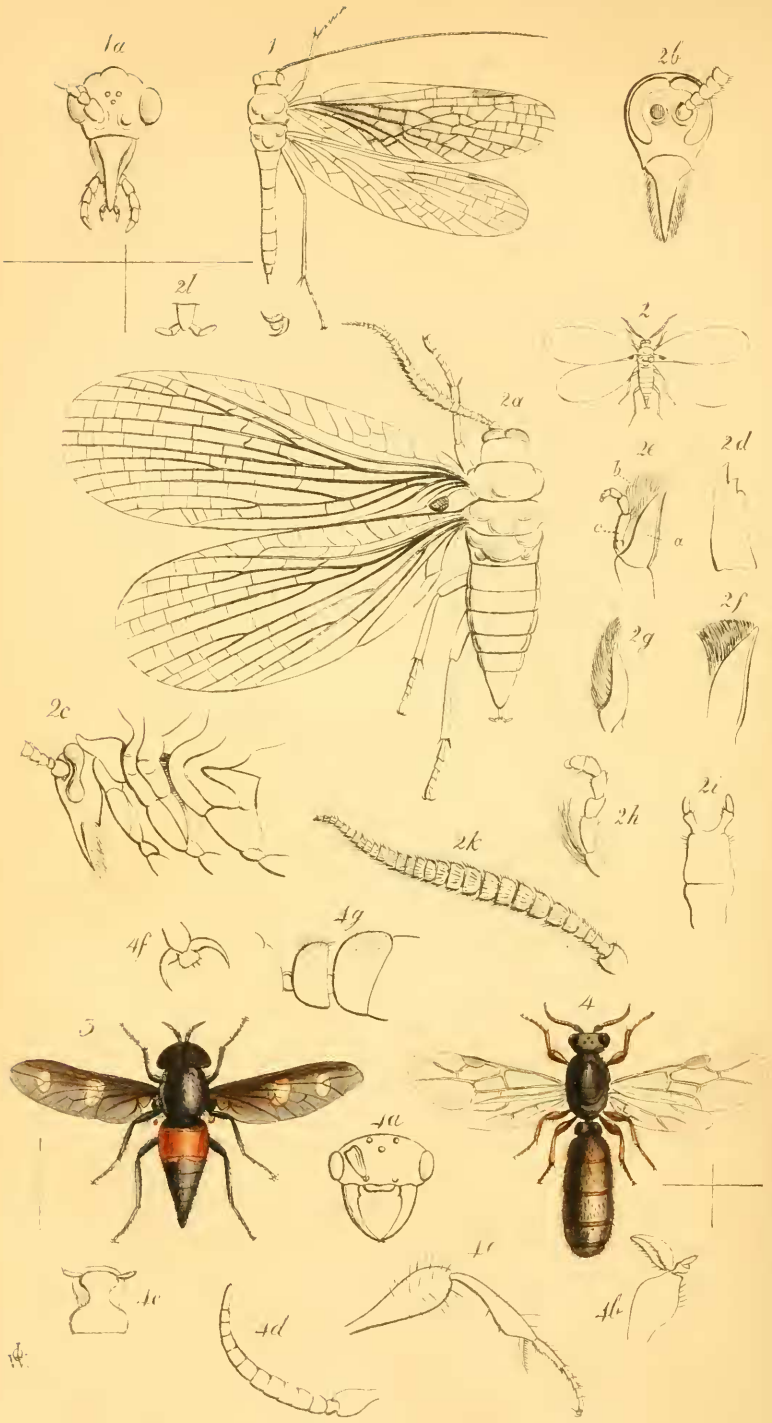
Obscure luteo-fulva, abdominis segmento 5to maris inermi; alis subcinereo-hyalinis, puncto magno nigro ad basin stigmatis, venisque brevibus transversis nebulosis.

Expans. alar. lin. 11.

Habitat in America boreali. Dom. E. Doubleday.

In Mus. Newman [nunc Mus. Britann.]

Obscure luteo-fulva, regione ocellorum nigra. Antennæ fuscae. Mesothorax linea laterali ad basin alarum punctoque parvo



utrinque nigricantibus; metathorax etiam puncto parvo utrinque obscuro; prothorax margine antico nigro-ciliato; abdominis segmenta basalia ad latera obscuriora, segmento 5to maris inermi. Alæ subcinereo-hyalinæ, puncto magno costali ad basin stigmatis nigro, stigmate ipso pallido; venis omnibus transversis cinereo-nebulosis, cellulisque nonnullis apicalibus puncto cinereo notatis; vena prima longitudinali pone stigma, tantum bis (interdum semel) bifida. Alæ ♀ cinereo magis notatæ.

Sp. 13. *Panorpa punctata*, Klug.

Testacea, thoracis maculis abdominisque basi fuscis; alis hyalinis, nervis punctoque in singula cellula nigris.

Habitat in Mexico.

P. communi paullo minor.

P. punctata, Klug. Mon. Panorp. p. 25, pl. ann. fig. 9.

Sp. 14. *Panorpa terminata*, Klug.

Testacea, capite thoraceque fusco-maculatis; alis hyalinis, apice nigricantibus.

Magnitudo præcedentis.

Habitat in Mexico.

P. terminata, Klug. Mon. Panorp. p. 26, pl. ann. fig. 10.

Sp. 15. *Panorpa Americana*, Swederus.

Testacea, alis latis flavescens, fasciis tribus fuscis (2da recta, ultima apicali), anticis ante fasciam 1m, et inter fascias 1m et 2m puncto parvo fusco; venis fulvis, in partibus fasciatis fuscis; abdominis segmento 5to in ♂ cornu brevi erecto armato.

Expans. alar. lin. 11.

Habitat in Georgia Americæ. Mus. nostr. ♂, ♀.

Panorpa Americana, Swederus, Act. Holm. 1787.

Panorpa fasciata, Fabr. Ent. Syst. ii. p. 98. Klug, Mon. Panorp. p. 252.

My specimens of this insect exactly agree with the descriptions of Swederus and Fabricius, and cannot be considered as identical with the subsequently described allied species. The *P. fasciata* of Klug appears to be composed of several distinct species confused together.

Sp. 16. *Panorpa venosa*, Westw.

Obscure fulva, meso- et metathoracis lateribus obscuris, abdomine obscuro, linea dorsali pallidiori; alis pallide flavo-luteis, venis transversis fasciis apiceque nigricantibus. ♀.

Expans alar. lin. 12.

Habitat in Georgia Americæ. In Mus. Britann.

Obscure fulva, regione ocellorum nigra. Antennæ fuscae, articulis duobus basalibus fulvis. Meso- et metathorax lobis lateralibus obscuris, scutellis pallidioribus. Abdomen fulvo-fuscescens, linea dorsali pallidiori. Pedes luteo-fulvi, tarsorum apice fusco. Alæ quam in sequentibus evidenter latiores et ad apicem magis rotundatæ, pallide flavo-luteæ, punctis numerosis obscure fuscis, uno prope basin (in alis anticis), fascia, in medio interrupta ante medium, linea brevi transversa incisa prope costam, tunc fascia obliqua irregulari pone medium apiceque irregulariter nigro-fuscis, venis transversis plus minusve nigro-fusco tinctis, stigmate fulvo; alæ posticæ minus maculatæ.

Sp. 17. *Panorpa confusa*, Westw.

Fulva, alis luteo-hyalinis, venis nigricantibus, transversis fusco-tinctis, fasciis apiceque tenuibus nigricantibus; abdominis segmento 5to maris supra spina longa armato, 6to ad basin haud inciso. ♂ ♀.

Expans. alar. lin. 11.

Habitat in America Septentrion. Massachusetts. In Mus. nostr.

Tota fulva, regione ocellorum antennisque nigris exceptis. Abdomen maris segmento 5to spina longiori acuta obliqua armato. Alæ lutescentes, costa basique magis luteis, venis nigricantibus; puncto parvo prope basin; fascia tenui, in medio interrupta, ante medium; tunc (pone medium) fascia tenui irregulari in medio geniculata, apiceque tenui, nigricantibus; venis transversis præsertim versus apicem alarum nigro tinctis; alæ posticæ minus variegatæ; articuli tarsorum ad apicem nigri.

I am indebted to Dr. Thaddeus W. Harris, a distinguished American Entomologist, for both sexes of this insect, which I received with the name of *P. fasciata* of Fabricius; from that species, however, they are quite distinct, as already noticed, whilst they have several characters which seem to warrant my considering them as specifically distinct from the following species.

Sp. 18. *Panorpa debilis*, Westw.

Luteo-fulva, abdominis basi supra nigro, segmento 5to cornu brevi obliquo armato, 6to basi supra emarginato; alis pallidis, fasciis apiceque fuscis.

Expans. alar. lin. 11.

Habitat in America Septentrionali. Dom. E. Doubleday.

In Mus. D. Newman [nunc Mus. Britann.]

Luteo-fulva, regione ocellorum nigra; antennis fuscis, ad basin rufescentibus. Abdomen segmentis tribus basalibus supra nigris; segmento 5to cornu brevi subobtusum obliquo supra ad apicem armato, 6to ad basin supra emarginato. Alæ pallidæ, luteo colore (nisi versus basin) vix tinctis; venæ longitudinales pallidæ (præsertim versus apicem alarum), puncto parvo versus basin; fascia in medio interrupta ante medium tunc (pone medium) fascia altera irregularis sublata, ad costam dilatata et in medio angulata apiceque lato fusco-nigris; vena 1ma longitudinalis pone stigma bis bifida. Tarsi articulis ad apicem nigris. Pedes setis brevibus nigris.

Individuum in Musæo Britannico vidi, ad hanc speciem ut mihi videtur etiam pertinens, læte fulvum, stigmatibus alarum pallide flavo cornuque dorsali segmenti 5ti abdominis maris magis elongato.

This appears to be a much weaker insect than the preceding; the veins of the wings are slender and pale coloured, and the markings of the wings are much paler.

Sp. 19. *Panorpa subfurcata*, Westw.

Obscure fulva, capite magis rufescente, abdomine supra ad basin obscuro, segmento 5to cornu brevi dorsali armato; alis fusco-fasciatis, vena pone stigma ad apicem vix furcata. ♂ ♀.

Expans. alar. lin. 11—13.

Habitat in Nova Scotia. In Mus. Britann.

Obscure fulva. Caput rufescens, regione ocellorum antennisque nigris, harum articulis duobus basalibus rufescentibus. Thorax supra obscure luteus. Abdomen luteo-fulvum, supra ad basin obscurum; segmento 5to cornu brevi dorsali armatum, 6to supra ad basin haud emarginato. Pedes lutei, tarsorum articulis ad apicem obscuris. Alæ pallidæ, maculis duabus prope basin, fascia transversa ante medium, macula transversa in medio costæ, tunc (pone medium) fascia obliqua irregularis in medio vix angulata, ad costam dilatata, apiceque sublato (albo punctato) maculaque ad angulum analem nigris; vena

Ima pone stigma bis furcata, furca secunda fere ad apicem alæ, vena transversa stigma cum hac vena conjungenti obliqua; maculæ basales in alis posticis obsoletæ.

Genus EUPHANIA, Westw.

Caput prothorace haud occultum, infra in proboscidem longitudine mediocri productum; *ocellis* 3.

Antennæ alis longitudine æquales. *Thorax* et abdomen ut in *Panorpa*. *Pedes* elongati, graciles, tibiis bicalcaratis; tarsorum unguibus acutis, basi tantum serrulatis, pulvillo magno intermedio adjecto. *Alæ* longæ, elongato-ovatæ; anticæ costâ dilatata haud areolata, disci venis longitudinalibus fere ut in *Panorpa* dispositis (vena prima post stigma, attamen ad apicem haud furcata), venis brevibus transversis valde irregularibus, nonnullis obliquis, venis alarum posticarum magis regularibus.

The general characters of this insect so closely resemble those of *Panorpa*, that it is not without some hesitation that I venture to separate it from that genus in the absence of an opportunity of examining the trophi, the only known specimen being contained in the collection of the British Museum, and it being contrary to the regulations of that institution to allow the dissection of specimens of natural history. As, however, there are several decided characters, such as the shorter proboscis, very long antennæ, dilated costa to the fore wings, and comparatively unarmed ungues, in which this insect differs from the species of *Panorpa*, (which together constitute a remarkably distinct group, which would be broken down by the introduction of the present species therein,) I have considered it best to regard it as generically distinct.

Euphania luteola, Westw. (Pl. XIV. fig. 1.)

Fulva, antennis (articulis 4 vel 5 basalibus fulvis exceptis) nigris, meso- et metathorace piceis, ad latera rufescentibus; abdomine piceo, segmentis 4 apicalibus fulvis, pedibus piceis, femoribus fulvis; alis pallide luteis, ad basin magis fulvis, venis discoidalibus fuscis, basalibus tamen fulvis, stigmate fusco.

Long. corp. lin. $5\frac{1}{2}$. Alar. expans. lin. $15\frac{1}{2}$.

Habitat — ? In Mus. Britann.

Fig. 1 a, the head seen in front.

Genus MEROPE, Newman.

Caput breve, sub prothoracem fere occultum; subtus in rostrum longitudine mediocre productum. *Antennæ* inter oculos insertæ, basi contiguæ dimidio corpore vix breviores hirtæ, 30-articulatæ; articulo 1mo crasso, 2do minori, 3tio minimo, 4to ad 10m sensim magnitudine crescentibus discretis transversis; reliquis 20 sensim decrescentibus apicalibus minutissimis. *Ocelli* 0. *Oculi* laterales, reniformes, supra in verticem conjuncti. *Trophi* mediocriter elongati, rostrum formantes. *Labrum* elongatum, apice acutum. *Mandibulæ* planæ, corneæ, rectæ, apice dentibus duobus acutis curvatis alteroque interno obtuso armatæ. *Maxillæ* e lobis duobus apicalibus conicis extus valde ciliatis conniventibus constantes; palpi loborum longitudine curvati, ut mihi videtur 5-articulati, articulo basali extus setis longis armato, reliquis irregularibus, ultimo, ut videtur, biannulato. *Labium* subquadratum, angulis anticis rotundatis, ciliatis; palpi labiales breves, biarticulati. *Prothorax* brevis, transversus; mesothorace angustior; meso- et metathorax equales majores. *Alæ* haud plicatæ latissimæ, apice rotundatæ, subæquales; venis multis longitudinalibus furcatis, venis minutis transversis connexis; costa lata in areas multas divisa. *Pedes* graciles, subæquales; tibiis omnibus apice bicalcaratis. *Tarsi* 5-articulati; unguibus integris. *Abdomen* ♀ obesum, apice acutum, appendiculis duobus minutis biarticulatis divergentibus terminatum.

This singular genus (of which a single specimen, collected by Mr. E. Doubleday at Trenton Falls, in the United States of North America, has hitherto only been seen) possesses so much the appearance of a *Hemerobius*, in the short and very broad posteriorly rounded wings, that Mr. Newman, who published a description of it in the last volume of the Entomological Magazine, was unable to decide as to the natural family to which it belonged. Having, however, through the kindness of that gentleman, had an opportunity of examining and dissecting the mouth of this unique individual, I have been enabled to determine that its natural situation is in the present family, with the females of which it further agrees in the two minute biarticulate appendages at the extremity of the body. The want of ocelli, emarginate eyes, dilated antennæ, simple ungues, broad wings, together with the singular character which the anterior pair of those organs exhibit, in the possession of a minute semicircular tuberculous appendage near the base of

the inner margin, are characters which at once distinguish it from every other genus in the family.

The only species is, from the last-named character, named

Merope tuber, Newman. Ent. Mag. v. 180.

(Pl. XIV. fig. 2.)

Fuscescens, antennis, capite et prothorace saturatoribus; abdomine pedibus, alisque dilutioribus, oculis nigris.

Corp. long. .35 unc. Alar. expans. 1.05 unc.

Habitat Trenton Falls, N. Amer. D. Doubleday.

[Mus. Britann.]

DESCRIPTION OF THE FIGURES.

2, the insect of the natural size; 2*a*, the same magnified; 2*b*, the head in front; 2*c*, the head and thorax sideways; 2*d*, mandible; 2*e*, maxilla; 2*f* and 2*g*, maxillary lobes; 2*h*, maxillary palpus; 2*i*, labium; 2*k*, antenna; 2*l*, apex of body.

Genus BITTACUS, Latreille.

Sp. 1. *Bittacus affinis*, Westw.

Testaceus, abdominis apice tarsisque posticis obscurioribus, alis pallide fusciscentibus, stigmatibus fusco, venisque parum fusco tinctis.

Long. corp. lin. 9. Expans. alar. lin. 19½.

Habitat in Brasilia. In Mus. Britann.

Antennæ gracillimæ, apice obscuriores. *Mesothorax* lobis lateralibus dorsi puncto medio nigro. *Abdomen* segmentis basalibus ad apicem cingulo tenuissimo nigro, apiceque incrassato obscuro. *Alæ* pallide fusciscentes, stigmatibus (cum cellula sequenti) quam in *B. italico* paullo longiore fusco; apiceque alarum fusco paullo obscuriùs tincto; venis nigricantibus fusco nonnihil nebulosis, præsertim ad basin venarum longitudinalium et in venis lineam obliquam pone medium alæ formantibus. *Costa* cum vena mediastina, venâ brevi transversa in alæ medio, connexa; apiceque venæ mediastinæ cum v. postcostali, venâ obliqua connexa; stigmatibus postice venam unicam emittente; vena ramos posticos venæ postcostalis conjungente, valde obliqua, et fere e basi rami inferioris emissa.

B. italico minor, alis magis coloratis.

B. brasiliensi etiam affinis, differt tamen stigmatibus fusco, &c.